Asbestos Demolition Inspection

Review of NESHAP and RIDOH Regulations

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March 2016
C: 401-304-6612

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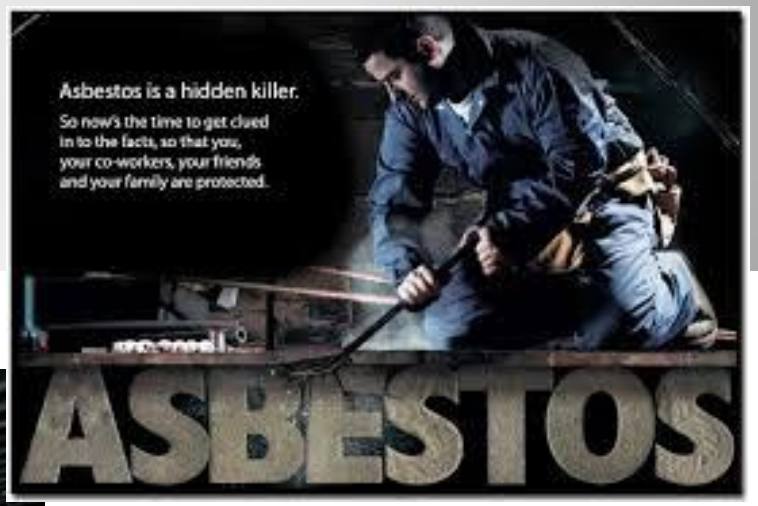
What is Asbestos?



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- Naturally occurring.
- Mined throughout the world.
- Long, thin, pliable fibers

TABLE 2.6. COMPARISON OF AVERAGE TENSILE STRENGTHS OF VARIOUS MATERIALS *

Type of Material	Tensile Strength, Lb per Sq In.
Ingot iron	45,000
Wrought iron	48,000
Carbon steel	155,000
"Nichrome" steel	243,000
Piano steel wire	300,000
Cotton fiber	73,000 to 89,000
Rock wool	60,000
Glass fiber	100,000 to 200,000
Chrysotile asbestos	80,000 to 200,000
Crocidolite asbestos	100,000 to 300,000
Amosite asbestos	16,000 to 90,000
Tremolite asbestos	1,000 to 8,000

* *Can. Mining and Met. Bull.* (1951)

- Resistant to heat, chemicals, electrically non-conductive, strong. Can be woven into cloth. Used for heat & sound insulation.

NATURALLY
THE BEST

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Types of Asbestos

Serpentine Group (one type):

- **Chrysotile – White Asbestos (most common)**

Amphibole Group (five types):

- **Amosite – Brown Asbestos**
- **Crocidolite – Blue Asbestos**

Rare Types:

- **Anthophyllite**
- **Tremolite**
- **Actinolite**

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Properties of Asbestos

- Fire Resistant
- High Tensile Strength
- Good Thermal Qualities
- Electrical Insulator
- Acoustical Properties
- Not chemically reactive
- Cheap
- Plentiful

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Asbestos Fibrous Structure

- Very Small – may be up to 700 times smaller than a human hair
- Invisible
- Long/Fibrous
- Sharp
- Very Light – may stay suspended in air for up to several days
- Polarized Light Microscopy (PLM)
- Phase Contrast Microscopy (PCM)
- Transmission Electron Microscopy (TEM)

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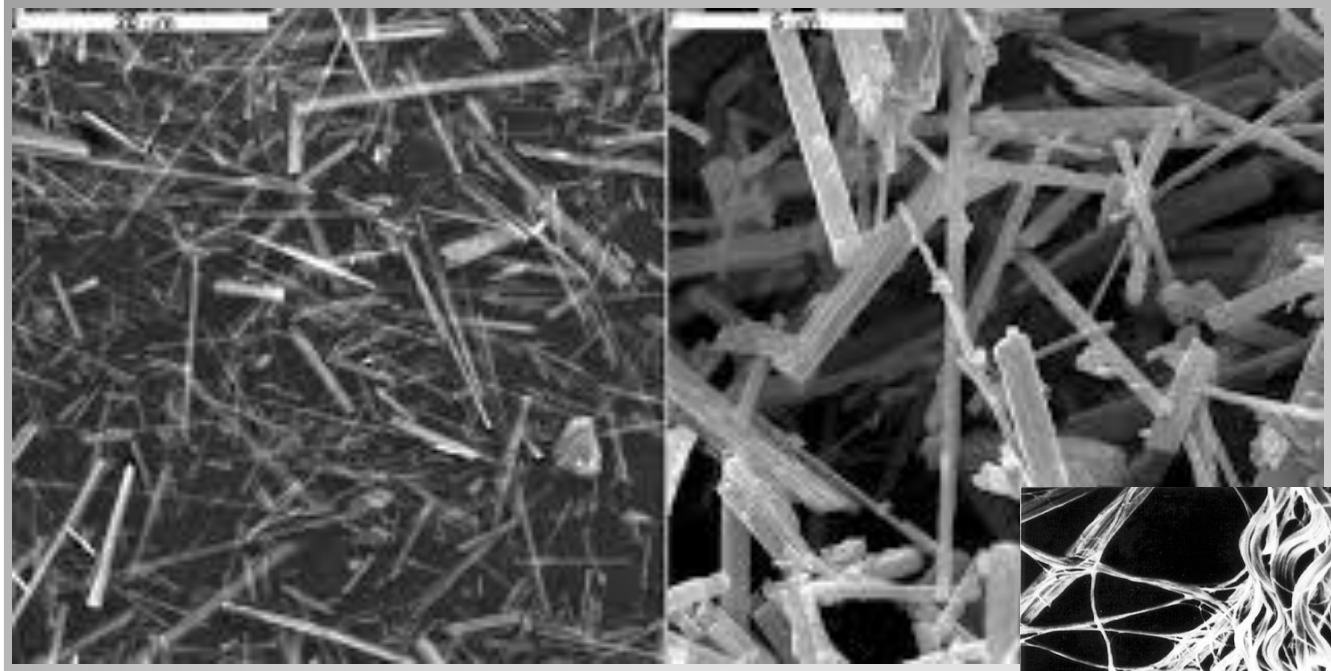

AMOSITE

(AMPHIBOLE)

CHRYSOTILE

(SERPENTINE)

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History

- Records show it was identified and used in Greek and Roman times.
- Discovery of major deposit in Quebec Canada in 1870's
- Use increased during industrialization and in World Wars.
- Post WWII increase in home and building uses.

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HISTORY of ASBESTOS

2,200 BC

EGYPTIAN PHARAOHS:
Embalmed bodies of Egyptian pharaohs begin to be wrapped in asbestos cloth to prevent decay

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Uses of Asbestos

- Widespread use emerged in late 1800's, peak usage 1930's-1970's
- >3-6,000 commercial products.
- Use is decreasing in US but increase in other parts of the world

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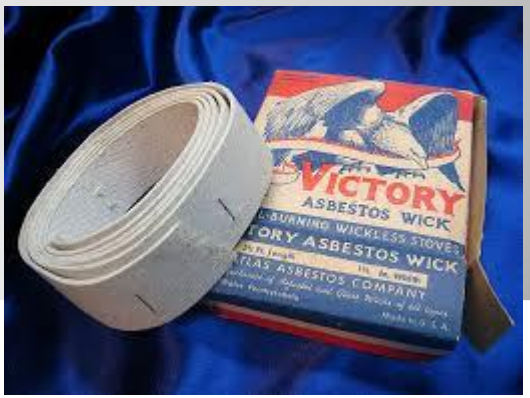
OLD CONSUMER PRODUCTS



MODERN DAY CONSUMER PRODUCTS

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THE ASBESTOS NESHAP

- **NESHAP Introduction**

  The Clean Air Act (CAA) requires the U. S. Environmental Protection Agency (EPA) to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Section 112 of the CAA, EPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under Section 112. On March 31, 1971, EPA identified asbestos as a hazardous pollutant, and on April 6, 1973, EPA first promulgated the Asbestos NESHAP in 40 CFR Part 61.

- Accordingly, the Asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations, and buildings (*excluding residential buildings that have four or fewer dwelling units).

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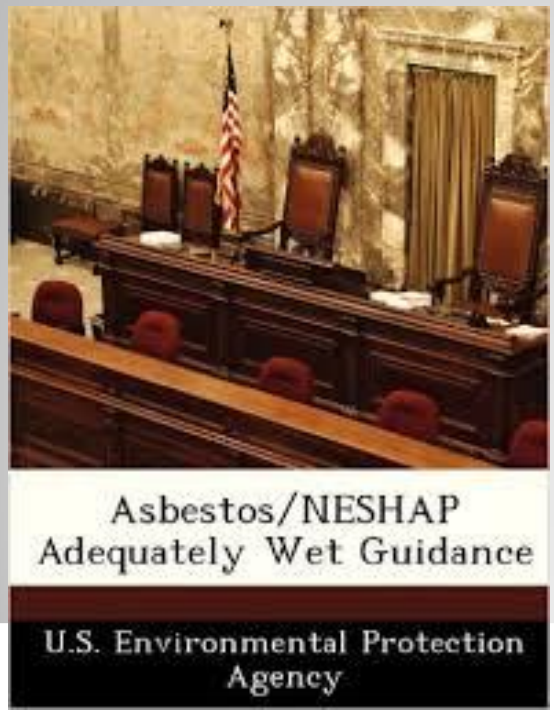
- The EPA's Asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material.

- In addition, the regulations require the owner of the building and/or the contractor to notify applicable State and local agencies and/or EPA Regional Offices before all demolitions, or before renovations of buildings that contain a certain threshold amount of asbestos.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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COMMON NESHAP QUESTIONS

- *What is the purpose of the Asbestos NESHAP regulation?*

The purpose is to protect the public health by minimizing the release of asbestos when facilities which contain asbestos-containing materials (ACMs) are demolished or renovated.

How much regulated asbestos-containing material (RACM) is disposed of annually from demolition/renovation operations?

Approximately 5.7 million cubic feet of RACM is disposed of annually. In accordance with the regulation, most RACM is taken to landfills, where it is covered by soil or other debris in order to keep it from releasing asbestos fibers.

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- *What is the difference between demolishing a facility and renovating it?*

  "Demolition" and "renovation" are defined in the regulation. You "demolish" a facility when you remove or wreck any load-supporting structural member of that facility or perform any related
  operations; you also "demolish" a facility when you burn it. You "renovate" a facility when you alter any part of that facility in any other manner. Renovation includes stripping or removing asbestos
  from the facility.

- *If a facility being renovated or demolished was built after 1975, do regulations in the Asbestos NESHAP apply?*

Yes. Building materials containing asbestos continued to be sold for years after their manufacture was banned. In fact, you can still purchase certain building materials containing asbestos such as roofing sealant or tile cement. There are NO exemptions based upon the date of construction nor age of the structure.

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- *Is moving a building regulated by the Asbestos NESHAP?*

Yes, moving a building is considered demolition and requires an asbestos survey and filing of a demolition notification with the appropriate regulatory agency.

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- **NESHAP Jurisdiction**

What is a "facility?“(EPA / NESHAP def.)

As defined in the regulation, a "facility" is any institutional, commercial, public, industrial or residential structure, installation or building (including any structure, installation or building containing condominiums, or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; or any active or inactive waste disposal site. Any building, structure or installation that contains a loft used as a dwelling is not considered residential. Any structure, installation, or building that was previously subject to the Asbestos NESHAP is not excluded, regardless of its current use or function.

NOTE: RIDOH does regulate 3 family and greater for renovation and demolition activities under their regulations R23-24.5 ASB

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- The asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP) requires all asbestos-containing materials (ACM) to be removed from a building prior to demolition by intentional burning. The NESHAP applies to a fire department's burning of residential buildings for training purposes and requires that all buildings be thoroughly inspected for asbestos prior to demolition.

- As stated in the November 1990 asbestos NESHAP revision (see 61.145(c)(10)): "If a facility is demolished by intentional burning, all RACM, including Category I and Category II nonfriable ACM, must be removed in accordance with the NESHAP before burning." Abandoned buildings utilized by fire departments for practice exercises involving partial burning are subject to this requirement. For buildings which are still structurally sound but which have previously been subjected to partial or total, intentional or unintentional burning, an inspection for the condition of all ACM should be conducted. Category I ACM should be examined for friability and condition. Friable materials or Category I materials that are friable and in poor condition must be removed prior to any further demolition activity.

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RULES AND REGULATIONS FOR ASBESTOS CONTROL

[R23-24.5-ASB]

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

DEPARTMENT OF HEALTH

Contact: David Spink or John O’Brien

Asbestos Abatement - Any activity involving the removal, encapsulation, enclosure, renovation, repair, demolition or other disturbance of friable asbestos containing materials.

Asbestos Containing Material (ACM) - Any material or product which contains more than one percent (1%) asbestos, as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM).

Regulated Asbestos Containing Material (RACM) - (a) Friable asbestos material; (b) Category I nonfriable ACM that has become friable; (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of the demolition or renovation operations regulated by these regulations.

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Private Residence - Any structure which is designated within National Building Code Use Groups R3 or R4.

R-3 one and two family dwelling, or adult and child care facilities that provide accommodation for eight or fewer persons of any age for less than 24 hrs, R-4 are intended for occupancy as residential care/assisted living facilities including more than nine but not more than sixteen occupants, excluding staff.

A2.2.2(b) The requirements for licensing and the submission of an asbestos abatement plan shall not apply to private residences as defined in these regulations.

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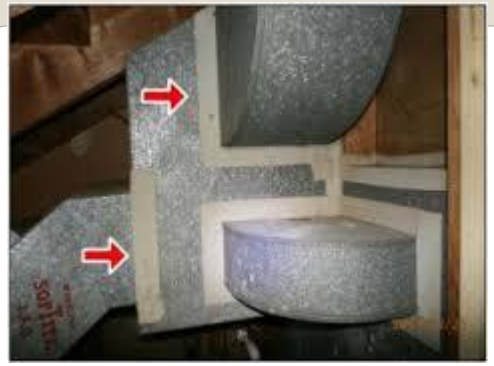

Spot Repair - Any removal, repair, encapsulation, enclosure or other disturbance which encompasses: (1) up to ten (10) linear feet of asbestos from piping and/or (2) up to twenty five (25) square feet of asbestos from any surfaces other than pipes. Large project divided into smaller segments are not Spot Repairs.

(a) Any building owner who intends to conduct an asbestos abatement project, with the exception of spot repairs as defined in these regulations, must submit an asbestos abatement plan in compliance with the requirements of Part C of these regulations and must not proceed with said project until written approval of said plan has been received from the Agency.

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Friable Asbestos Material - Any ACM that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure.

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EMERGENCY ABATEMENT PROJECT

(b) A building owner shall contact the Agency in advance for permission to conduct an Emergency Asbestos Abatement Project in the absence of an approved asbestos abatement plan. Ordinarily permission will be granted only to prevent personnel injury or property damage. However, if the emergency is of such a nature that immediate action is deemed essential, the building owner may proceed to resolve the emergency in the most expeditious manner possible. Nevertheless, all asbestos abatement that is beyond the scope of Spot Repairs, as defined by these regulations, Section A 10 must be performed by a licensed asbestos contractor

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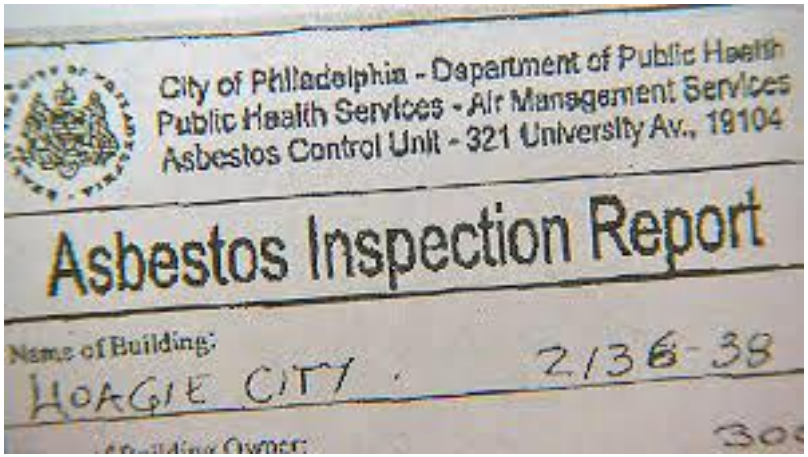
The building owner shall notify the Agency no later than one (1) working day following the beginning of an emergency asbestos abatement project and confirm the name and license number of the Asbestos Contractor, the amount of asbestos containing material involved and the expected length of the abatement project. Within ten (10) working days of completing the project, the building owner shall submit a written report to the Agency which includes as a minimum: a narrative description of the area(s) abated, including the type and quantity of asbestos containing material; annotated blueprint(s), floorplan(s) or other engineering drawing(s) which show the location(s) of abated and remaining asbestos containing material; specific work procedures followed during the abatement process; copies of the results of clearance air testing; copies of disposal receipts for all asbestos that was removed; and any other information specifically requested by the Agency.


City of Philadelphia - Department of Public Health
Public Health Services - Air Management Services
Asbestos Control Unit - 321 University Av., 19104

Asbestos Inspection Report

Name of Building:
HOAGIE CITY 2136-38

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A.2.3(d) No building or demolition permit involving asbestos abatement shall be issued by any municipal or state official unless the application for the permit includes a certified copy of an approved *abatement plan* and a certified copy of the license of the Asbestos Contractor who shall undertake the work.

A.4.2 (c) Removal of asbestos containing material from a building ordered demolished by a municipal building official in accordance with Section 23-27.3-125.5 of the General Laws of Rhode Island may be handled as an Emergency Asbestos Abatement Project under the following conditions:
(1) All asbestos abatement work is performed by a licensed Asbestos Contractor under the provisions of an Asbestos Abatement Plan previously approved for the demolition of unsafe structures in the jurisdiction of the municipal building official ordering the demolition;
(2) The licensed Asbestos Contractor complies with the provisions of Paragraphs A.4.2(a) and (b) of these regulations;
(3) The Asbestos Contractor provides the Agency with all project specific information required by the approval letter for the previously approved Asbestos Abatement Plan and not included with the reports required by Paragraph B.2.2(a) of these regulations; and
(4) All asbestos containing material is removed from the building prior to its demolition.

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ASBESTOS INSPECTOR

Building Inspections

In order to locate and identify all ACMs in a building prior to demolition, NESHAPs requires that buildings be inspected. Only properly trained RI licensed and accredited Asbestos Inspectors can perform these inspections. Most states also have licensing requirements that must be met before a Building Inspector can inspect buildings in those states. If the work is not performed by a RI licensed Asbestos Inspector, they would not be accepted by the state regulatory agency. Additionally, some states require that building inspections not be old or outdated, unless the older inspection was confirmed and verified by a licensed Asbestos Building Inspector. This makes sense when it is realized that many buildings inspected in the past may have been inspected based on a specific scope, these older inspections may not be representative of the building in its current state (prior to the demolition).

Refer to the RIDOH letter dated 4/11/2018 & 2/1/2012

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Potential Locations

- HVAC system (boiler, piping, breeching)
- Wallboard, gypsum board, skim coat.
- Ceiling tiles, popcorn ceiling applications
- Floor tiles, linoleum, mastics
- Roofing shingles and flashing
- Transite siding and panels
- Surfacing, Thermal System Ins., Misc.

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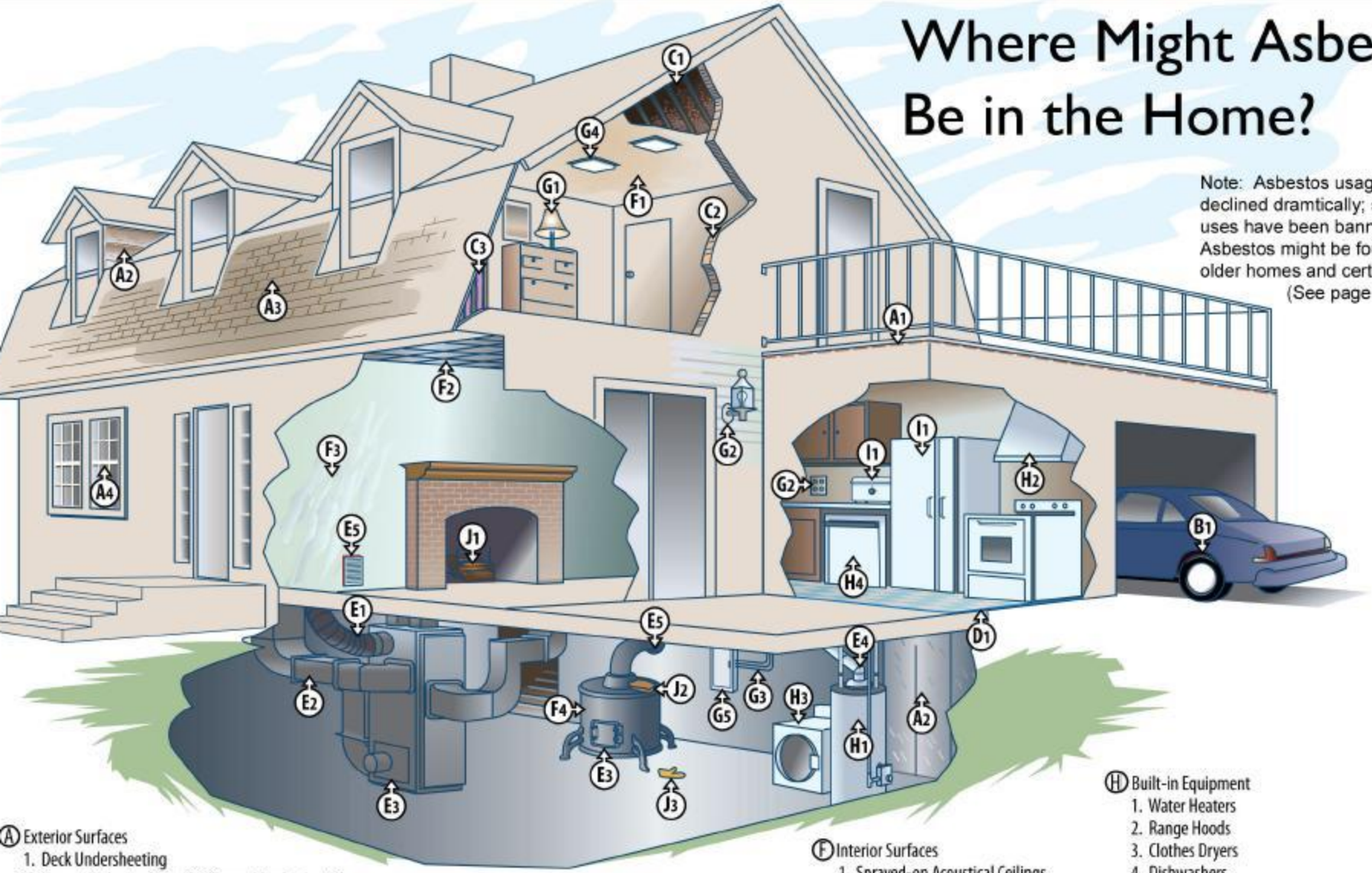
Where Might Asbestos Be in the Home?

Note: Asbestos usage has declined dramtically; some uses have been banned. Asbestos might be found in older homes and certain products.
(See page 5)



Ⓐ Exterior Surfaces
1. Deck Undersheeting
2. Cement Asbestos Board Siding and Undersheeting
3. Roof Felt and Shingles
4. Window Putty

Ⓑ Automobiles
1. Brake Linings, Clutch Facings, and Gaskets

Ⓒ Insulation
1. Vermiculite Attic Insulation
2. Batt Insulation
3. Vermiculite Wall Insulation

Ⓓ Flooring
1. Vinyl Asbestos Sheets, Tiles, and Undersheeting

Ⓔ Boilers, Heaters and Piping
1. Heat Source Covering
2. Air Duct Lining
3. Door and Cover Gaskets
4. Pipe Lagging
5. Wall Gaskets and Lining

Ⓕ Interior Surfaces
1. Sprayed-on Acoustical Ceilings
2. Acoustical Tiles
3. Textured Paint
4. Heat Reflectors (Woodstoves)

Ⓖ Electrical Equipment
1. Lamp Sockets
2. Outlet and Switchboxes
3. Insulation on Knob and Tube Wiring
4. Recessed Lighting
5. Main Panel and Fuse Boxes

Ⓗ Built-in Equipment
1. Water Heaters
2. Range Hoods
3. Clothes Dryers
4. Dishwashers

Ⓘ Appliances
1. Refrigerators, Freezers, Portable Dishwashers, Toasters, Slow-cookers, Ovens, Hair Dryers (not shown) and Portable Heaters (not shown)

Ⓙ Miscellaneous
1. Fireplace Logs
2. Asbestos Hot Pads
3. Asbestos Gloves

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ASBESTOS CONTAINING
DUCT INSULATION

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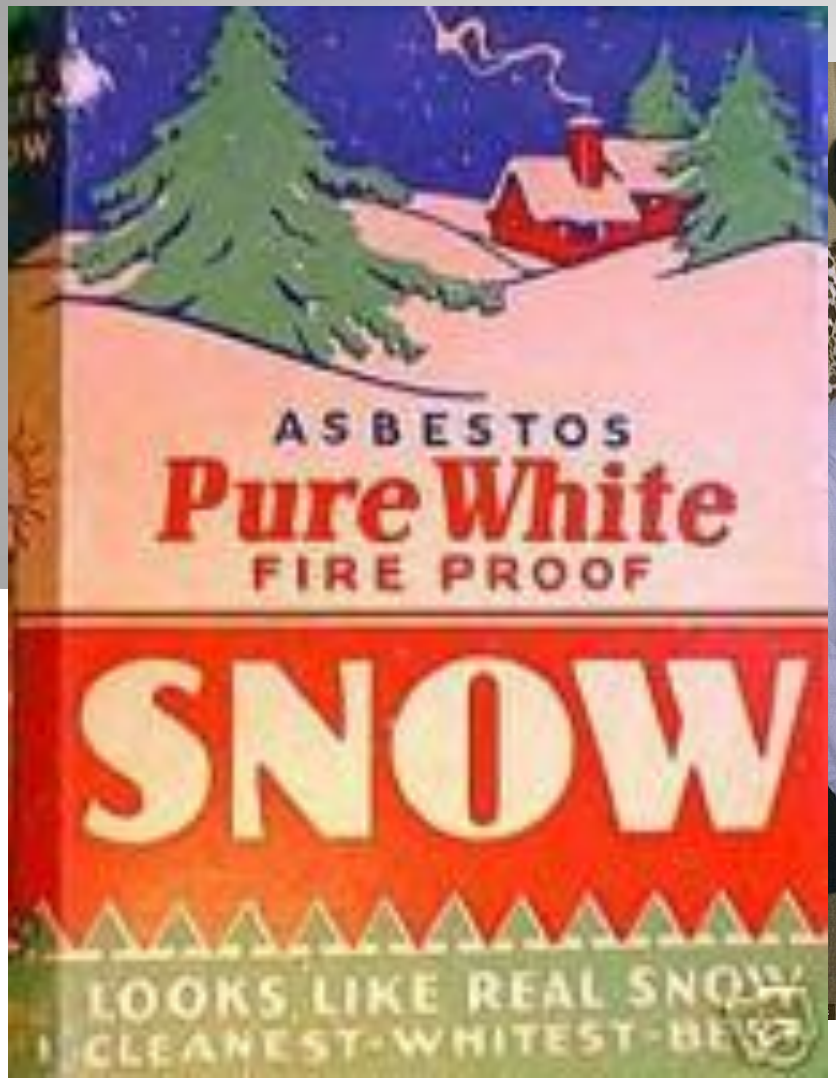

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Vermiculite Insulation Concerns

- Vermiculate was mined near asbestos deposits, as a result, asbestos has been found in vermiculate in small amounts.
- Was used primarily as insulation in attics and between block walls.
- The EPA recommends keeping the material intact and not disturb.

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ZONOLITE
VERMICULITE ATTIC
INSULATION

IS THE USE OF ASBESTOS IN BUILDING PRODUCTS BANNED IN THE US?

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NO- THERE IS ONLY A LIMITED BAN IN THE UNITED STATES

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APPROXIMATELY 57* COUNTRIES WORLD WIDE CURRENTLY BAN THE USE OF ASBESTOS IN BUILDING PRODUCTS

*as of Sept 30, 2015

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EPA- 1989- Asbestos Ban and Phase Down Rule.

Designed to phase out and ban the use of asbestos as in ingredient in consumer goods over a period of 7 years beginning in 1990.

Passed Congress in 1989.

Opposed by industry overturned in 1991.

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BANNED ASBESTOS USES

ITEMS	By Whom
Spray-on	USEPA/NESHAP
TSI	USEPA/NESHAP
NEW USES	TSCA
Flooring Felts	TSCA
Paper Products	TSCA
Joint Compound	CPSC

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Health Effects

- Inhalation hazard - Class A carcinogen
- Small fibers – Inhaled deep into lung
- Body's defense mechanism
- Nasal hair, mucas, mucociliary escalator, macrophage
- Synergistic Effect - Smoking 50X-90X Lung Cancer risk increase with asbestos exposure

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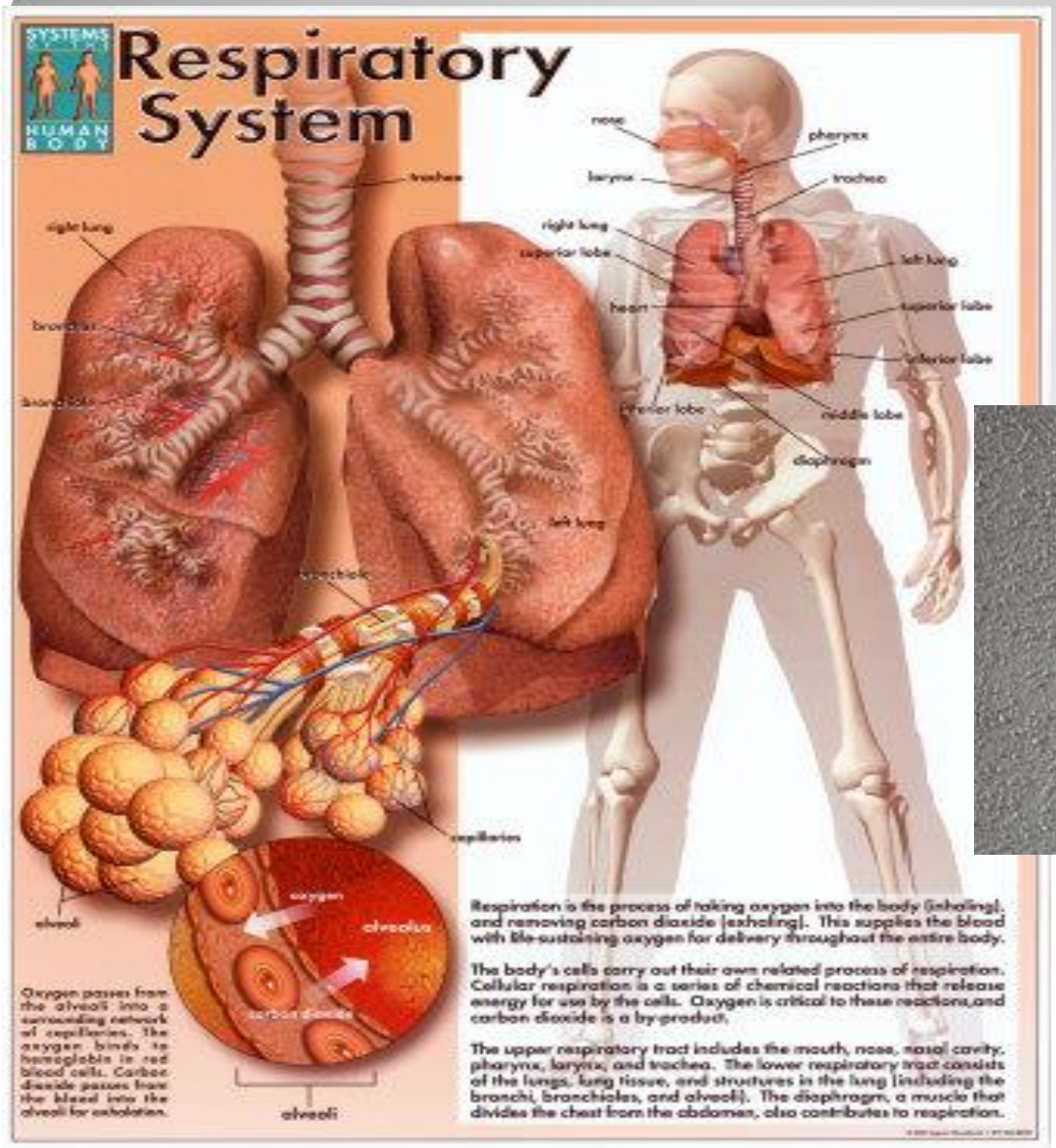

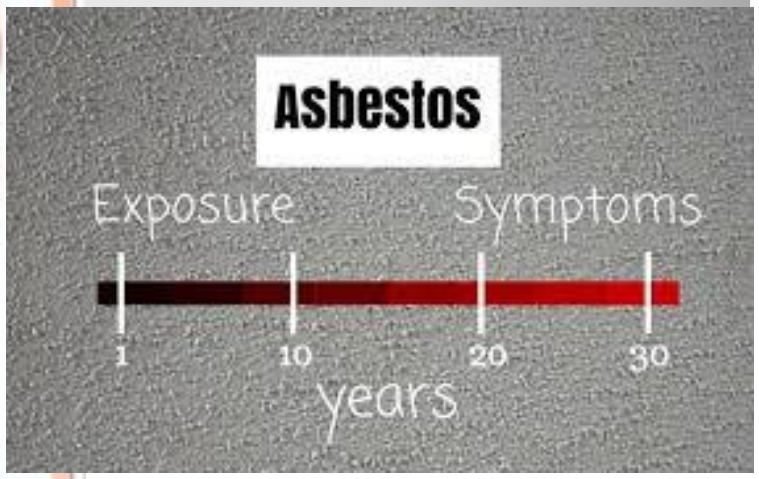

Latancy Period

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Health Effects

- **Asbestosis** –scarring of lung tissue
- **Lung cancer–** Genetic predisposition – Smoking is greatest risk
- **Mesothelioma**- Not dose related
- Pleural Plaques- thickening of lining
- Latency Period. 20 – 40 years
- Gastrointestinal cancers

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Personal Protective Equipment

- Related to work activities and potential exposure.
- Disposable garments- TYVEK
- Head covering, foot covering, gloves
- Safety glasses, Safety shoes
- Hard hat, hearing protection
- Respirator

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DEMO CLEARANCE

- If the building is going to be immediately demolished and no entry the Asbestos Designer may require a visual inspection by a RI Licensed Consultant with no air samples assuming the structure is immediately being demolished with no ENTRY.
- If the building is to be re-entered for any reason (salvage, utility, etc..) clearance air samples should be performed to ensure safety.

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Respiratory Protection

RESPIRATORS

- Air Purifying (APR)– Negative Pressure & PAPR ½ face-Full Face
- Supplied Air Type C - Grade D Air 300’
- Self Contained Breathing Apparatus SCBA

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- Particulate & Chemical Cartridges
- HEPA filter- 99.97% 0.3u
- Magenta
- Quantitative vs Qualitative Fit Test
- Seal Check
- APR not acceptable for Oxygen

Deficient environments <19.5%

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Exposure Limits

Personnel monitoring

- OSHA 8hr TWA = 0.10 f/cc^2
- OSHA Excursion Limit 30 min = 1.0 f/cc^2

Phase Contrast Microscopy

- Negative Exposure Assessment
- Clearance Level 0.010 f/cc^2 1,000 liters
- School (K-12) - TEM 70 structures / mm^2

AHERA

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ACM or ACBM

- Surfacing Material- sprayed, troweled or otherwise applied
- Thermal System Insulation (TSI)-
- Miscellaneous ACM- all other ACM- Flooring applications, transite, roofing
- >1% asbestos content

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Building Systems

- Structural System- Beams, columns, walls, foundation
- Mechanical Systems- HVAC,
- Plumbing Systems - Plumbing
- Electrical System – Wiring and electrical panels

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Identification and Damage Assessment

- Bulk Sampling- PLM >1%
- Pressumed ACM or PACM
- Friable vs Non-Friable
- TSI, Surfacing, Miscellaneous
- Good Condition, Damaged, Significantly Damaged

Fiber release episodes- Minor & Major

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Bulk Sampling

Surfacing Material

- 1,000 sq ft or less – minimum 3 samples
- >1,000 – 5,000 sq ft- minimum 5 samples
- >5,000 sq ft – minimum of 7 samples

Thermal Insulation

- Minimum of 3 per homogenous area
- Minimum of 1 per patched TSI if less than 6’
- Tees, Elbows, Valves, Manner Sufficient

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Bulk Sampling (cont.)

Miscellaneous Materials

- Manner Sufficient to Determine, a minimum of one sample is acceptable but typically additional samples are warranted of miscellaneous materials.

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Regulations

- AHERA 40 CFR 763 & ASHARA (Schools K-12)
- RIDOT
- OSHA 29 CFR 1910.1001
- OSHA 29 CFR 1926.1101
- OSHA 29 CFR 1910.134
- RI Rules & Regulations R23-24.5-ASB
- NESHAPS 40 CFR Part 61

This is only a partial list of the asbestos regulations

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FACT ONE:

Although asbestos is hazardous, the risk of asbestos-related disease depends upon exposure to airborne asbestos fibers.

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FACT TWO:

Based upon available data, the average airborne asbestos levels in buildings seem to be very low. Accordingly, the health risk to most building occupants also appears to be very low.

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FACT THREE:

Removal is often not a building owner's best course of action to reduce asbestos exposure. In fact an improper removal can create a dangerous situation where none previously existed.

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FACT FOUR:

EPA only requires asbestos removal in order to prevent significant exposure to airborne asbestos fibers during building demolition or renovation activities.

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FACT FIVE:

EPA does recommend a proactive, in-place management program whenever asbestos-containing material is discovered.

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Any Questions?

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THANK YOU